

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) Publication number: **0 583 615 A1**

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **93111228.8**

(51) Int. Cl.⁵: **B29D 30/34, B60C 9/11**

(22) Date of filing: **13.07.93**

(30) Priority: **21.07.92 IT TO920621**

(43) Date of publication of application:
23.02.94 Bulletin 94/08

(84) Designated Contracting States:
DE ES FR GB IT

(71) Applicant: **BRIDGESTONE CORPORATION**
10-1, Kyobashi 1-Chome
Chuo-Ku
Tokyo 104(JP)

(72) Inventor: **Slegenthaler, Karl J.**
Via dei Pescatori, 153
I-00100 Roma, Ostia(IT)

(74) Representative: **Jorlo, Paolo et al**
Studio Torta,
Via Viotti, 9
I-10121 Torino (IT)

(54) **Method of producing a toroidal road vehicle tire carcass.**

(57) A toroidal road vehicle tire carcass (1) having two annular beads (2) connected by a toroidal reticulated structure (4) defined by a number of elongated reinforcing elements located between and extending substantially radially in relation to the beads (2) is formed from a single continuous cord (5) for forming

a succession of U-shaped loops (6), each of which is wound about both beads (2) so as to form a tubular reticulated structure (4), and presents an open end (8) and a closed end (9) located and connected along an annular interconnection line (7) extending centrally in relation to the beads (2).

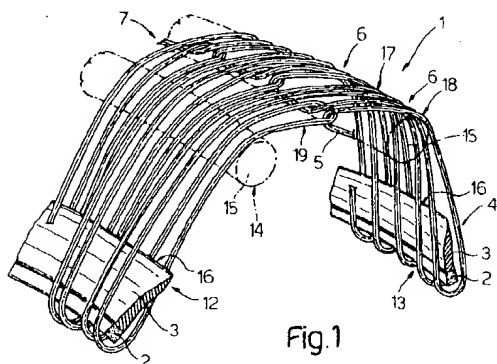


Fig. 1

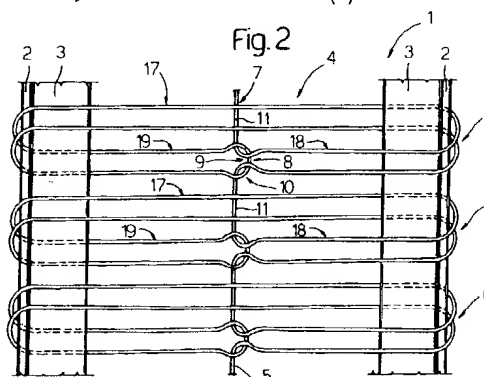


Fig. 2

EP 0 583 615 A1

The present invention relates to a method of producing a toroidal road vehicle tire carcass.

More specifically, the present invention relates to a straightforward, low-cost method of producing a toroidal radial tire carcass comprising two annular beads connected by a toroidal reticulated structure in turn comprising a number of elongated reinforcing elements connecting and extending substantially radially in relation to the beads.

According to the present invention, there is provided a method of producing a toroidal road vehicle tire carcass comprising two parallel annular beads, and a toroidal reticulated structure connecting the two beads and comprising a number of elongated reinforcing elements located between and extending substantially radially in relation to the beads; said method being characterized by the fact that said elongated reinforcing elements are formed from a single continuous cord wound in such a manner as to form a succession of U-shaped loops, each of which is wound about the two beads so as to form a tubular reticulated structure, and presents an open end and a closed end connected along an annular interconnection line extending in an intermediate position in relation to the beads.

A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Fig.1 shows a schematic view in perspective of a portion of a carcass formed using the method according to the present invention;

Fig.2 shows a spreadout view of the Fig.1 carcass portion.

Number 1 in Fig.1 indicates a toroidal road vehicle tire carcass.

Carcass 1 comprises two annular beads 2 with respective fillers 3; and a toroidal reticulated structure 4 connecting beads 2 and in turn comprising a number of reinforcing elements extending between and substantially radially in relation to beads 2.

In the example shown, said reinforcing elements are formed from a single continuous cord 5 wound in such a manner as to form a succession of U-shaped loops 6 extending from an annular interconnection line 7. Line 7 lies substantially in a plane between the planes of beads 2, and, as in the example shown, is preferably located substantially centrally in relation to the planes of beads 2.

Each loop 6 presents an open end 8 and a closed end 9, and is wound about both beads 2 and fillers 3 so as to form, together with the other loops 6, a substantially tubular structure 4. More specifically, each loop 6 is arranged with both ends 8 and 9 along line 7, and with open end 8 engaging closed end 9, so as to connect ends 8 and 9 by means of a succession of interconnections 10 along line 7. Moreover, along line 7, there extends

a succession of cord portions 11, each connecting the open end 8 of one loop 6 to the open end 8 of the next loop 6.

Carcass 1 as described above is preferably formed on a supporting frame 12 comprising an inner portion 13 defined by beads 2 and forming the skeleton of carcass 1; and a removable auxiliary outer portion 14 defined by two rings 15, each consisting, in known manner not shown, of a number of releasably-connected curved segments. Portion 14 is located between and radially outwards in relation to beads 2, so as to define, with beads 2, two annular openings 16.

When forming structure 4, frame 12 is preferably rotated about its axis, and structure 4 is woven about beads 2 and outwards of portion 14. More specifically, each loop 6 presents an intermediate portion 17 extending between the two beads outwards of portion 14 and through one of openings 16; and two end portions 18 and 19, the first of which, adjacent to open end 8, extends outwards of openings 16, and the second of which, adjacent to closed end 9, extends through the other opening 16.

Claims

1. A method of producing a toroidal road vehicle tire carcass (1) comprising two parallel annular beads (2), and a toroidal reticulated structure (4) connecting the two beads (2) and comprising a number of elongated reinforcing elements located between and extending substantially radially in relation to the beads (2); said method being characterized by the fact that said elongated reinforcing elements are formed from a single continuous cord (5) wound in such a manner as to form a succession of U-shaped loops (6), each of which is wound about the two beads (2) so as to form a tubular reticulated structure (4), and presents an open end (8) and a closed end (9) connected along an annular interconnection line (7) extending in an intermediate position in relation to the beads (2).
2. A method as claimed in Claim 1, characterized by the fact that said continuous cord (5) is so wound that said interconnection line (7) is located substantially centrally in relation to the bead planes.
3. A method as claimed in Claim 1 or 2, characterized by the fact that it comprises an initial stage consisting in forming a supporting frame (12) for the carcass (1); said frame (12) comprising an inner portion (13) defined by the two beads (2) and forming the skeleton of said

carcass (1), and a removable auxiliary outer portion (14) located between and radially outwards in relation to the beads (2); said reticulated structure (4) being woven about the beads (2) and outwards of the auxiliary outer portion (14). 5

4. A method as claimed in Claim 3, characterized by the fact that said inner and outer portions (13, 14) define two annular openings (16); each said loop (6) comprising an intermediate portion (17) extending between said two beads (2) and through one of said openings (16), and two end portions (18, 19), one of which extends through the other of said openings (16). 10 15

20

25

30

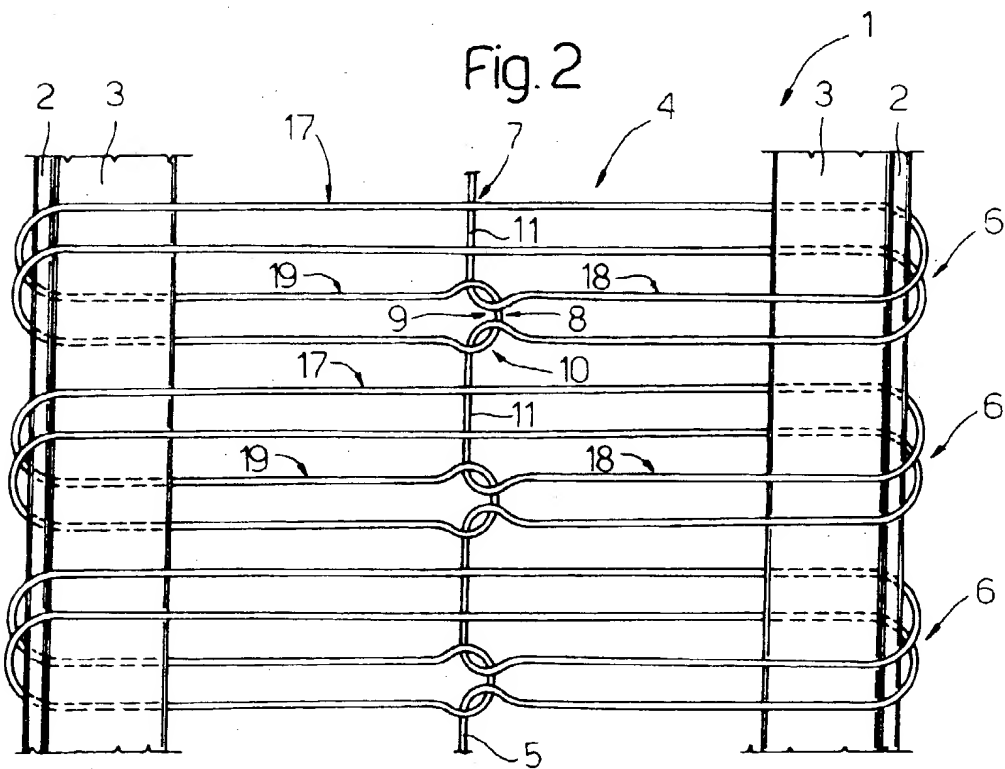
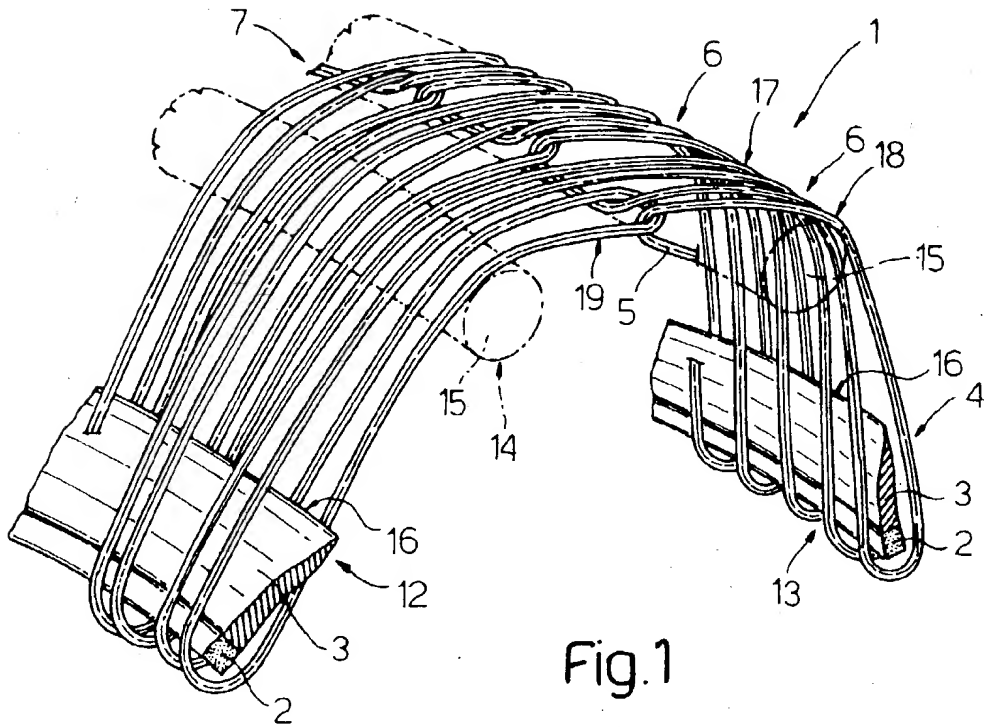
35

40

45

50

55





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 11 1228

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|--|--|--|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
| A | EP-A-0 009 018 (POLYAIR MASCHINENBAU) * the whole document * --- | 1 | B29D30/34 B60C9/11 |
| A | FR-A-410 370 (P. I. VIEL) * the whole document * --- | 1,3,4 | |
| P,A | EP-A-0 549 869 (BRIDGESTONE CORP.) * the whole document * --- | 1,3,4 | |
| A | FR-A-2 132 509 (KLEBER-COLOMBES) * page 11, line 4 - line 15; figures 11,12 * --- | 1,2 | |
| A | FR-A-1 513 157 (BRUNSWICK CORP.) * page 3, column 2, line 2 - line 6; figure 4 * * page 4, column 2, line 17 - line 37 * ----- | 1 | |
| The present search report has been drawn up for all claims | | | TECHNICAL FIELDS SEARCHED (Int. Cl.5) B29D B60C B29C |
| Place of search THE HAGUE | | Date of completion of the search 28 October 1993 | Examiner FREGOSI, A |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | |